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Book Review by James L. Capra of Harnessing  
the Sky: Frederick "Trap" Trapnell, the U.S.  
Navy's Aviation Pioneer, 1923-1952. by  
Frederick M. Trapnell, Jr. and Dana Trapnell Tibbitts

Capra, James L.

Air and Space Power Journal

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As with all new theories building on a sample rather than a full range of instances (something that time and length preclude), cohesion theory is vulnerable to criticism from those who claim that the author has cherry-picked his examples or that he has oversimplified them. But this work is an introduction to a new theory, not a synthesis of previous research, and Castillo does lay out flaws of the earlier interpretations systematically, case by case, and almost mechanically as he works his way from one army to the next in his small collection.

A greater concern than the validity and completeness of the sample is that Castillo offers no insights into how one of the deficient armies can overcome its shortcomings against a more determined force. No mechanism exists for changing an army even though some armies in his sample change over time, switching from one type to another due to politics, social conditions, and other factors. He is short on means to instill the messianic impulse, by implication a desirable development if American and Western forces are to stay the course in the long and perpetually inconclusive war against a collection of enemies even less structured than the North Vietnamese. Because the future will probably confront the American professional force with a variety of messianic foes, someone should take Castillo's thesis to the next level down, from theory to technique for overcoming a built-in weakness of professionalism and weakening instead the die-hard foe. Probably the author would have a stronger case had he been able to more directly address the factors that, for instance, changed the French and German armies from one war to the next. Perhaps that sort of exploration would offer at least a hint of guidance for American forces increasingly facing inferior opponents with superior determination and willingness to stay the course regardless of the time or cost.

**John H. Barnhill, PhD**  
*Houston, Texas*

**Harnessing the Sky: Frederick "Trap" Trapnell, the U.S. Navy's Aviation Pioneer, 1923–1952** by Frederick M. Trapnell Jr. and Dana Trapnell Tibbitts. Naval Institute Press (<http://www.usni.org/naulinstitutepress>), 291 Wood Road, Annapolis, Maryland 21402, 2015, 288 pages, \$29.95 (hardcover), ISBN 9781612518480.

In the vast literature of World War II airpower heroes, is it possible to have missed a vital aviation innovator? The biography of Frederick "Trap" Trapnell questions the notion that innovation relies on the inspirations of elite scientists and exploits of new technologies. Set in the pre- and post-World War II era, this biography illuminates the infancy of America's test pilot program. Notably, it is written by Trap's son Frederick Jr. and granddaughter Dana Trapnell Tibbitts. Although the authors' kinship clearly establishes credibility, the biography spends relatively little time on Trap's difficult home life, instead casting him in a predictably heroic light. Nonetheless, the familial bias does not diminish the captivating story of arguably the first engineer test pilot, who emerged during a time when that job at home was as dangerous as the war overseas.

Trap's ability to change tactics, procedures, and mind-sets during his lifetime is still a quality often taken for granted in today's Navy and Air Force. To name a few of his accomplishments, he was a superior pilot, commanded an aircraft carrier, invented the antispin parachute, and survived two bailouts and a crash landing. However, in arguably his innovation of greatest impact, Trap developed the balanced design philosophy. While others chose to sacrifice safety in the pursuit of performance, Trap's procedures mitigated often-unforeseen dangers, resulting in superior aircraft for the Navy. Deviating from precedent, he built engineering teams that not only isolated aircraft design flaws and vulnerabilities but also pro-

posed concrete fixes. This scientific approach to improving the force birthed the engineer test pilot and revolutionized naval flight-testing. In a time when Hitler's Germany was rolling through Europe and when Japanese technology was on par with America's, Trap's innovations, which extended into every facet of aviation, were critical to wartime success.

Trap's innovations succeeded because of his emphasis on changing practices instead of acquiring new technology. However, he was not the only innovator of the time: Airmen such as Billy Mitchell also made procedural advancements—albeit through more blustery processes. In contrast to Mitchell and other pilots who gained fame from speed records, daring raids, and even public trials, Trap remained the quiet professional. Highlighting this humility—and in contrast to Jimmy Doolittle's 574-page autobiography—the authors showcase Trap's use of only two paragraphs to summarize his career. Even so, his quiet efforts were pivotal in designing and testing aircraft in the twentieth century through his methodology of integrating flight-test pilots with aircraft developers.

A comparison of Trap to other naval innovators, such as William Moffett, reveals that he had considerably less involvement with the political battles that surrounded naval aircraft. However, in an action that restored naval aviation's credibility, Trapnell was one of the first to recognize US aircraft's limitations against their World War II German and Japanese opponents. To resolve this dilemma, he personally redesigned the Navy's test aircraft—the F4F Corsair—ensuring it could outfly the Japanese Zero. Importantly, Trap found a key balance, showcasing procedural innovation without neglecting technology. His focus on changing mind-sets and procedures combined naturally with technological advancements to create one of the most successful naval aircraft of World War II.

For the astute listener, Trap's call for advancements in tactics, procedures, and mind-sets can still be heard. His lessons were drawn at a time when, much like today, senior leaders requested that aviators turn their efforts toward airpower advancement. Benchmarking a humble approach to innovation—often lacking in today's technology-dependent forces—Trap demonstrated that the definition of improvement does not need to be inextricably linked with high-end contracts. Instead, his message is that innovation has to do with improving cultural standards and war-fighting processes; technology is simply one means of arriving there.

*Harnessing the Sky* is a valuable read for contractors and flight-test engineers. However, it is also applicable for aviators who are challenged to innovate in a technology-dependent force. For any audience, Vice Admiral Trapnell is worthy to stand among both the pioneers of military aviation and today's flight-test programs. His legacy prompts military operators to question the conventional thinking that ties innovation solely to costly new technology. It is of key importance that aviators—like Trap—find the procedures within their purview that they can refine to meet current threats. The principal message of Fredrick Trapnell's example, given a clear voice in this inspiring biography, is that all United States flyers need to be innovators.

**Maj James L. Capra, USAF**  
*Naval Postgraduate School*

**Ways of War: American Military History from the Colonial Era to the Twenty-First Century** by Matthew S. Muehlbauer and David J. Ulbrich. Routledge (Taylor & Francis Group) (<https://www.routledge.com/>), 711 Third Avenue, New York, New York 10017, 2014, 537 pages, \$72.95 (softcover), ISBN 9780415886772.

Matthew Muehlbauer and David Ulbrich's *Ways of War* is an ambitious undertaking, attempting to include in a single volume the entirety of the American wartime experience. The authors further seek to analyze and distill tactical, operational, and strategic highlights